User's Manual

CONTROL30

15+15 Band
Digital Equalizer

ALTO®

www.altoproaudio.com

Version 2.3 September 2005

— **English** —

SAFETY RELATED SYMBOLS

This symbol, wherever used, alerts you to the presence of un-insulated and dangerous voltages within the product enclosure. These are voltages that may be sufficient to constitute the risk of electric shock or death.

This symbol, wherever used, alerts you to important operating and maintenance instructions. Please read.

⏚ Protective Ground Terminal

~ AC mains (Alternating Current)

Hazardous Live Terminal

ON: Denotes the product is turned on.

OFF: Denotes the product is turned off.

WARNING

Describes precautions that should be observed to prevent the possibility of death or injury to the user.

CAUTION

Describes precautions that should be observed to prevent damage to the product.

Disposing of this product should not be placed in municipal waste and should be Separate collection.

WARNING

- **Power Supply**

  Ensure that the mains source voltage (AC outlet) matches the voltage rating of the product. Failure to do so could result in damage to the product and possibly the user.

  Unplug the product before electrical storms occur and when unused for long periods of time to reduce the risk of electric shock or fire.

- **External Connection**

  Always use proper ready-made insulated mains cabling (power cord). Failure to do so could result in shock/death or fire. If in doubt, seek advice from a registered electrician.

- **Do Not Remove Any Covers**

  Within the product are areas where high voltages may present. To reduce the risk of electric shock do not remove any covers unless the AC mains power cord is removed.

  Covers should be removed by qualified service personnel only.
  No user serviceable parts inside.

- **Fuse**

  To prevent fire and damage to the product, use only the recommended fuse type as indicated in this manual. Do not short-circuit the fuse holder. Before replacing the fuse, make sure that the product is OFF and disconnected from the AC outlet.

- **Protective Ground**

  Before turning the product ON, make sure that it is connected to Ground. This is to prevent the risk of electric shock.

  Never cut internal or external Ground wires. Likewise, never remove Ground wiring from the Protective Ground Terminal.

- **Operating Conditions**

  Always install in accordance with the manufacturer's instructions.

  To avoid the risk of electric shock and damage, do not subject this product to any liquid/rain or moisture. Do not use this product when in close proximity to water.

  Do not install this product near any direct heat source.

  Do not block areas of ventilation. Failure to do so could result in fire.

  Keep product away from naked flames.

IMPORTANT SAFETY INSTRUCTIONS

Read these instructions

Follow all instructions

Keep these instructions. Do not discard.

Heed all warnings.

Only use attachments/accessories specified by the manufacturer.

- **Power Cord and Plug**

  Do not tamper with the power cord or plug. These are designed for your safety.

  Do not remove Ground connections!

  If the plug does not fit your AC outlet seek advice from a qualified electrician.

  Protect the power cord and plug from any physical stress to avoid risk of electric shock.

  Do not place heavy objects on the power cord. This could cause electric shock or fire.

- **Cleaning**

  When required, either blow off dust from the product or use a dry cloth.

  Do not use any solvents such as Benzol or Alcohol. For safety, keep product clean and free from dust.

- **Servicing**

  Refer all servicing to qualified service personnel only.

  Do not perform any servicing other than those instructions contained within the User's Manual.

PREFACE

Dear Customer:

Thanks for choosing ▲LTO CONTROL30 and thanks for choosing one of the results of ▲LTO AUDIO TEAM job and researches.

For our ▲LTO AUDIO TEAM, music and sound are more than a job...are first of all passion and let us say...our obsession!

We have been designing professional audio products for a long time in cooperation with some of the major brands in the world in the audio field.

The ▲LTO line presents unparalleled analogue and digital products made by Musicians for Musicians in our R&D Centers in Italy, Netherlands, United Kingdom and Taiwan. The core of our digital audio products is a sophisticated DSP (Digital Sound Processor) and a large range of state of the art algorithms which have been developed by our Software Team for the last 7 years.

Because we are convinced you are the most important member of ▲LTO AUDIO TEAM and the one confirming the quality of our job, we like to share with you our work and our dreams, paying attention to your suggestions and your comments.

Following this idea we create our products and we will create the new ones! From our side, we guarantee you and we will guarantee you also in future the best quality, the best fruits of our continuous researches and the best prices.
Our ▲LTO CONTROL30 is the result of many hours of listening and tests involving common people, area experts, musicians and technicians. The results of this effort is a DSP hi-performance equalizer that can be used in applications as musical performances, installation and sound reinforcement.
Besides we offer to you a number of factory EQ curves that we collected and transformed in presets now available in our small, efficient and easy to use ▲LTO CONTROL30.

Nothing else to add, but that we would like to thank all the people that made the ▲LTO CONTROL30 a reality available to our customers, and thank our designers and all the ▲LTO staff, people who make possible the realization of products containing our idea of music and sound and are ready to support you, our customer, in the best way, conscious that you are our best richness.

Thank you very much.
▲LTO AUDIO TEAM

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1. INTRODUCTION

Purchasing ▲LTO CONTROL30, you purchase a very powerful equalizer, easy to use and contained in a very efficient single unit rack package.

▲LTO CONTROL30 is equipped with two powerful and separate configurable DSP channels, allowing to use up to **30 parametric EQ filters** in order to obtain the desired sound and timbre out of the musical signals. CONTROL30 is a versatile and very powerful machine...also don't forget to check our 60 factory presets, they will surprise you for their quality, showing the versatility they give to ▲LTO CONTROL30!

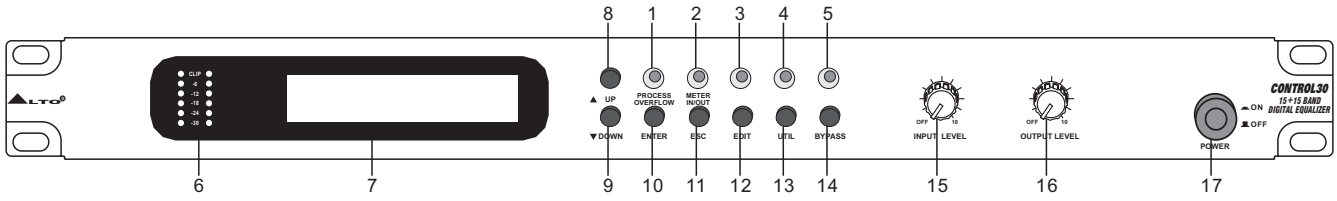
The 30 equalization DSP filters have been designed for a general purpose use and are very powerful when processing full band input signals as CD sources or final results of mixing sessions. These algorithms are fully dual mono/stereo algorithms and use very powerful high precision and symmetrical filters, designed for professional use, able to modify the sound colour improving the overall sound quality without introducing any loss or distortion. All the algorithms are based on classical algorithms for the audio signals filtering, modified and optimized. Thanks to the experience of ▲LTO AUDIO TEAM researchers.

2. FEATURE LIST

- Robust and Compact Design
- 24/32 bits Digital Audio Processor
- MPU Control
- Variable Input / Output Gain
- Illuminated Power Switch
- Digital Saturation LED and Digital VU-Meters
- Up to 17 dBu Line Level
- Easy to Operate Front Panel Controls and Display
- SMT Design for Greater Reliability
- Optimized Signal Path to Provide Superior Sound
- Manufactured Under QS9000, VDA6.1 Quality System

3. FRONT AND BACK PANELS DESCRIPTION

3.1. control Panel (Front Panel)



1. Digital Overflow
2. Meter In/Out LED
3. Edit LED
4. Utility LED
5. Bypass LED
6. VU-Meters
7. LCD Alphanumeric display 20x2
8. Up key
9. Down key
10. Enter key
11. Esc key
12. Edit key
13. Utility key
14. Bypass key
15. Analog Input volume
16. Analog Output gain
17. Power ON/OFF Switch

a. Analog Levels

- Analog Input Level Potentiometer (15): The input level control sets the main input gain, before the signal reaches the input bus. It controls both the Input 1 and Input 2 levels simultaneously.

- Analog Output Level Potentiometer (16): The output level control sets the level going to the amplifier or mixer from ▲LTO CONTROL30.

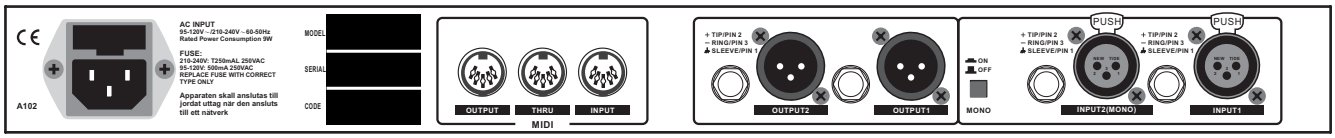
b. LED and Illuminated Power Switch

- Digital Saturation LED (1): Displays the signal level coming into the input during normal operation. If the signal level is too high, this LED will light and you will begin to hear distortion.

- Meter In/Out LED (2): These VU-meters show the input signal level [LED (2) OFF] or the output digital signal level.

- Power On/Off Switch (17): Turns the apparatus on and off.

3.2. Analog Connections (Back Panel)



a. Analog Inputs/Outputs

- Inputs: These are 1/4"TRS and XLR balanced connectors which connect to sources such as the channel inserts of mixing consoles. They may be used with nominal input levels from consumer to professional audio. For Mono applications, use the Input 2 once set manually the MONO ON/OFF switch to ON.

- Outputs: These are 1/4"TRS and XLR balanced connectors which connect to devices such as the channel inserts on a mixing console or power amplifier inputs. For Mono applications, use the Output1 and /or the Output2 once set manually the MONO ON/OFF switch to ON.

- MONO ON/OFF Switch: This switch sets the operational mode, switch to ON for MONO applications.

b. MIDI Connectors

- MIDI In: 5-poles DIN connector for the MIDI input to the CONTROL30.

- MIDI Thru: 5-poles DIN connector for the MIDI thru.

- MIDI Out: 5-poles DIN connector for the MIDI output from the CONTROL30.

c. Power Connector

- Power Connector: This is an IEC 3-pole socket for connecting the AC power supply to the CONTROL30.

4. INSTALLATION & CONNECTION

4.1. Power Up and Audio Connections

a. Audio Connections

The connections between the CONTROL30 and the other audio devices have to be made using high quality cables so to prevent bad performances of the CONTROL30 itself. So it should be good to use low-capacitance shielded cables with a flexible internal conductor. Connect the cables to the CONTROL30 properly by observing the following precautions:

- Do not bundle audio cables with AC power cords.
- Do not place audio cables and CONTROL30 near sources of electromagnetic interference such as transformers, monitors, computers, etc.
- Always unplug cables by firmly grasping the body of the plug and pulling directly outward.
- Do not place cables where they can be stepped on.
- Avoid twisting a cable or having it make sharp, right angle turns.

b. Power Up Setting

Before turning on the CONTROL30's power, check if:

- All connections have been made correctly.
- The volume controls of the amplifier or mixer are turned down.

Insert the Power plug into the POWER input on the rear panel of the CONTROL30 and plug the power cord into an AC outlet.

Turn on the power of the CONTROL30, pushing the ON/OFF button on the front panel.
Turn on the power of the amplifier/mixer, and adjust the volume.

4.2. Analog

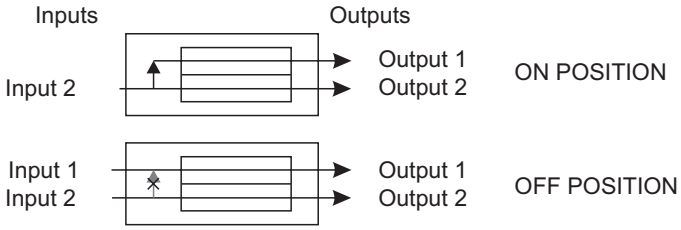
a. Levels Setting

Proper setting of the input and output levels is crucial in order to achieve the maximum signal-to-noise ratio. It is possible to say that it is usually best to set both input and output level controls at 3/4 or 75% of full. This will decrease the possibility of overload distortion and keep the amount of background noise to a minimum.
If the VU-meter or the Digital Saturation LED on the CONTROL30 begin to clip (turn red), turn down the Input level or decrease the volume of the source (instrument, mixer, etc.). If the output level is causing the mixer or amp to distort, turn the Output Level down.

4.3. Installation

a. Mono Use of CONTROL30

The CONTROL30's Input2 can be used as MONO input when necessary setting in the proper way the switch MONO ON/OFF on the back panel of CONTROL30 itself. When the MONO ON/OFF switch is manually set to ON position, physically the Input2 will be routed also on the internal Input1 line.



When the MONO ON/OFF switch is set to OFF position, the Input2 is no more routed on the Input1 line and CONTROL30 works in full stereo configuration.
When the input signal is mono, it has to be connected to the Input2 and the MONO ON/OFF switch must be set to ON.

b. Standard Use

The CONTROL30 may be placed almost anywhere: on a table, on top of an amp, next to a mixing console. If it will be on furniture, check the rubber feet provided to the bottom of the unit. Make sure to place the CONTROL30 away from other audio equipment that may induce fields and away from the signal wiring.
It is possible that CONTROL30 may pick up noise fields generated by other equipment such as large power amplifiers; in this case, move the CONTROL30 until the noise goes away.

c. Application Examples

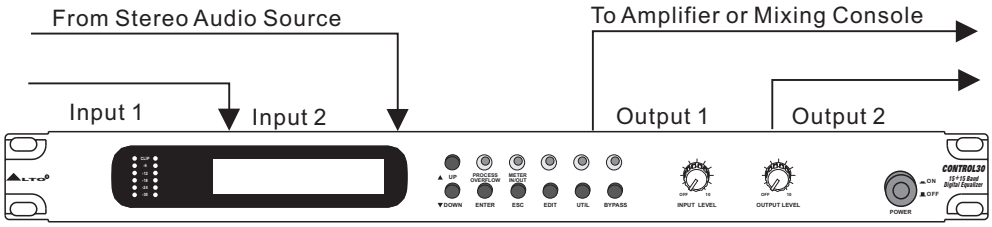
- line Instrument

When connecting audio cables and/or turning power on and off, make sure that all devices in your system have their volume controls turned down.
CONTROL30 has four inputs (two 1/4" TRS inputs and two XLR balanced inputs) and four outputs (two 1/4" TRS outputs and two XLR balanced outputs) allowing the CONTROL30 to be used in a classical Stereo In and Stereo Out connection or in Mono configuration as described above.

• MONO. Set manually the MONO ON/OFF switch to position ON. Connect one audio cable to the Input2 of the CONTROL30 from a mono source, and one or two other audio cables from the Output1 and Output2 of the CONTROL30 to a mono/stereo amplification system or one/two mixer inputs.

• STEREO. Set manually the MONO ON/OFF switch to position OFF. Connect two audio cables to the Input1 and Input2 of the CONTROL30 from a stereo source, and two other audio cables from the Output1 and Output2 of the CONTROL30 to a stereo amplification system or two mixer inputs.

This connection scheme is suitable also for processing Hi-Fi stereo sources like CD players or recording decks. To process the signal coming from low signal voltage devices such as Hi-Fi turntable cartridges or microphones, please insert before CONTROL30 a suitable pre-amplifier (i.e. a RIAA stage for turntables, our α MicTube for microphones).



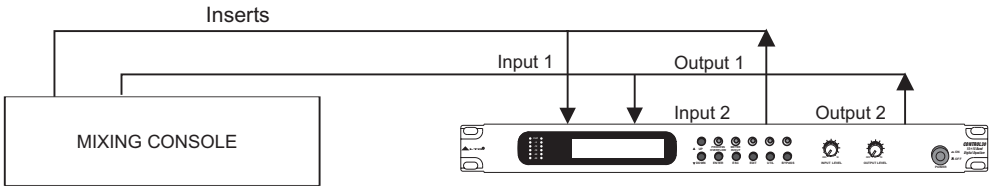
- Mixer

Interfacing to a Mixing Console

The CONTROL30 can accept mono or stereo sends at all system levels. The input circuitry of the CONTROL30 can easily accept professional levels while having enough input and output gain to interface with the low signal levels of home recording systems.

The CONTROL30 may be connected to a mixing console connecting the unit directly to the channel insert socket of a single channel that is to be processed. Another way of interfacing the CONTROL30 to a mixer or recording console would be in-line between the output of your mixing console and the input of a tape deck or power amplifier. This last setup would be used only if you wanted to process the entire mix.

Using Inserts



In the above figure it describes the situation in which you want to apply the CONTROL30 to a couple of channels arriving to a mixing console, in order to apply the desired dynamic process to single instrument's signals; in this case you will have to use a mixer which features individual channel inserts. Insert jacks on the back of a mixer provide a way of 'inserting' external processing equipment into the signal path. The insert occurs after the input amplifier, and before the channel fader; essentially it is the same as connecting the source (instrument or mic) into the CONTROL30 before the mixer's channel input. Usually, insert connections require a special, stereo-splitting Y-cord to be connected, known as TRS connector. This connector has a stereo jack which plugs into mixer's channel insert socket, and a couple of mono jacks (input and output) which will plug into CONTROL30 via jack-XLR adapters. Fitting this kind of cabling will virtually insert into one mixer's channel the EQ process. Take good care in adjusting CONTROL30 input and output levels, in order to satisfy the dynamics needs of both the processed channels. Do not use the CONTROL30 the effects send/return connections found on most mixers for effect modules, as they could lead to heavy frequency response alterations. Improper level setting when using a digital processor is the most common cause of noise and distortion problems.

4.4. Operational Overview

Switching ON the CONTROL30, after an initialization procedure, the last stored preset will be loaded. Changes not saved **will be lost**.

To load exactly the last preset configuration running before shutdown of the CONTROL30, it's necessary to store these modifications using the STORE Function available into the UTILITY Menu. After the initialization procedure, on the LCD will appear the first field of the UTILITY Menu and the UTILITY LED will turn ON.

Utility Button(13): To access the UTILITY Menu, it's necessary to push the UTILITY Button (13).

If the CONTROL30 is already working on UTILITY Menu (UTILITY LED (4) = ON), each further use of the button will have no effect.

Using the UTILITY Menu is possible to access the following functions:

Load Preset: This function allows the loading of one of the 124 available presets, where the first 60 presets (1- 60) are factory presets, and the presets from 61 to 124 are the user's configurable presets and all not initialized (Empty) when CONTROL30 is shipped.

To Load a Preset:

- Select "Load Preset" using **UP/DOWN** buttons.
- Press **ENTER** button to access the further sub-menu.
- Select the chosen preset using **UP/DOWN** buttons.
- Press **ENTER** to load the preset or press **ESC** button if you decide not to load the preset.

Once terminated the sequence above, on the display will appear the name of the selected preset and the system will go back to the main menu.

Store Preset: This function allows the storing on one of the 60 available memory locations the modified (using the Editing Menu) user's preset, starting from one of the 64 available factory presets.

To Store a Preset:

- Select "Store Preset" using **UP/DOWN** buttons.
- Press **ENTER** button to access the further sub menu.
- Select the memory location (Empty or already occupied from a previous user's preset) where to store the new user's preset using **UP/DOWN** buttons.
- If you want to give up, press **ESC** to go back to the main menu without storing the new preset, otherwise, press **ENTER** to store the new preset. The user can choose the identification name for the new preset using 6 characters max. The blinking character will be modified using the **UP/DOWN** buttons. When choosing the character, press **ENTER** to confirm and go to the next one. Pressing **ESC** before the 6th character, the old name will be maintained as name of the new preset. Pressing **ENTER** as confirmation of the 6th character, the new preset will be stored with the new name. There is no possibility to correct a confirmed character, if necessary to change again the name, repeat the storing process from the beginning.
  Once terminated the sequence above, on the display will appear the name of the new stored preset and the system will go back to the main menu.

Equ Setup

This function allows the user to select the type of EQ to be used:

Graphical 2x15 Dual Mono (15 filters per channel)
This is a graphical EQ (fixed Q and frequencies) with independent settings for each channel. When this type of EQ is selected, only a channel a time can be edited. To select the channel to be edited, click the **EDIT** key and select Channel item.

Parametric 2x15 Dual Mono (15 filters per channel)
This is a parametric EQ (variable Q and frequencies) with independent settings for each channel. When this type of EQ is selected, only a channel a time can be edited. To select the channel to be edited, click the **EDIT** key and select Channel item.

Graphical 2x15 Stereo (15 filters per channel)
This is a graphical EQ (fixed Q and frequencies) in which both channels share the same settings. When this type of EQ is selected, both channels are simultaneously edited. If the **EDIT** key is pressed and Channel item is selected, the parameter shows LNK (linked) and cannot be changed.

Parametric 2x15 Stereo (15 filters per channel)
This is a parametric EQ (variable Q and frequencies) in which both channels share the same settings. When this type of EQ is selected, both channels are simultaneously edited. If the **EDIT** key is pressed and Channel item is selected, the parameter shows LNK (linked) and cannot be changed.

Graphical 1x30 Mono (30 filters / one channel)
This is a graphical EQ (fixed Q and frequencies) with 30 filters on one channel. When this type of EQ is selected, only a channel works and can be edited. If the **EDIT** key is pressed and Channel item is selected, the parameter shows LNK (linked) and cannot be changed.

Parametric 1x30 Mono (30 filters / one channel)
This is a parametric EQ (variable Q and frequencies) with 30 filters on one channel. When this type of EQ is selected, only a channel works and can be edited. If the **EDIT** key is pressed and Channel item is selected, the parameter shows LNK (linked) and cannot be changed.

To change EQ Type:

-Click Util key
-Select EQ Setup
-Press **ENTER** to access the sub-menu
-Select the EQ Type using **UP/DOWN** buttons
-Press **ENTER** to confirm
-The system asks confirmation of change: press **ENTER** to go on.
At this point the system loads a default FLAT preset of the same type of the selected EQ type.
To know what EQ type is currently loaded, click **UTIL** key, then select the item EQ Type using **UP/DOWN** keys.

Warning!

Both the Factory and the User presets are classified by the EQ types described above. When the user is in the Load Preset function an identifier in the lower right corner of the display describes the EQ type the preset belongs to:
G2M: Graphical 2x15 Dual Mono
P2M: Parametric 2x15 Dual Mono
G2S: Graphical 2x15 Stereo
P2S: Parametric 2x15 Stereo
G1M: Graphical 1x30 Mono
P1M: Parametric 1x30 Mono
Only a preset belonging to the currently selected EQ Type can be loaded. If the user tries ie. to load a parametric preset on a graphical equalizer, the system will refuse to load it and the display will show:
Warning! This preset cannot be loaded

MIDI Setup: The MIDI SETUP utility allows the user to set up the CONTROL30 MIDI configuration.
The configurable MIDI parameters are:

- **MIDI Channel:** Allows to define the MIDI CHANNEL to associate to the CONTROL30 when connected to remote MIDI devices. When MIDI CHANNEL is set to OFF, the CONTROL30 will ignore MIDI commands coming from external MIDI devices.
- **MIDI Output:** When this function is set to ON, it is possible to ECHO on the MIDI output of the CONTROL30 all the incoming MIDI messages.

Output Attenuation: This control allows the digital output volume setting. This parameter is a system parameter and its modifications act on all the presets.

Bypass Button (14): Using this button is possible to bypass the process, sending to the CONTROL30 outputs exactly the input signals. This is a digital bypass and the input signal is anyway converted digitally before being sent to the outputs. When the CONTROL30 is in this mode (Bypass LED (5) = ON), all the buttons except the" bypass" button are disabled.

Up/Down Button (8/9): These buttons are used to navigate the menus and to modify the parameter values.

Enter/Esc Button (10/11): These buttons are used to access or to leave the menus or to confirm the parameter values.

Edit Button (12): This button allows the user to enter the EDIT Menu (the Edit LED(3) will be ON). When entering the Edit Menu, the user will be able to access and modify all the parameters related to the process. When the user modifies one parameter value, the LED (1) starts to blink to signal the update. The LED will blink until the storing of the new modified preset in one of the 60 available locations.

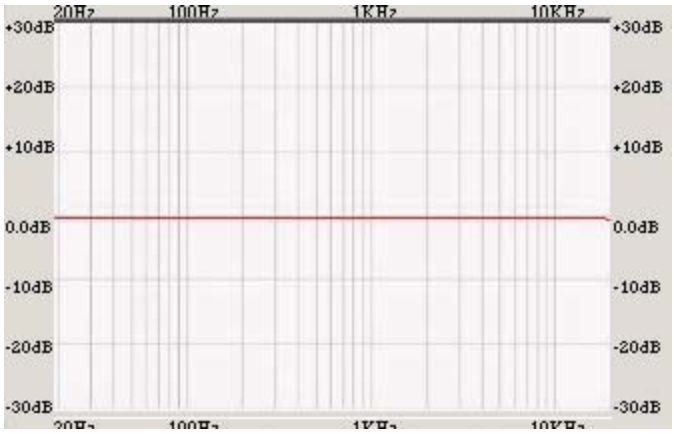
VU-Meter: This function allows the user to use the VU-meters (6) to show the input signal level or the digital output signal level.

LED Meter (2): This LED is ON when the VU-meters are showing the digital output level and is OFF when the VU-meters are showing the analog signal input level.

5. PRESET FUNCTION DESCRIPTIONS

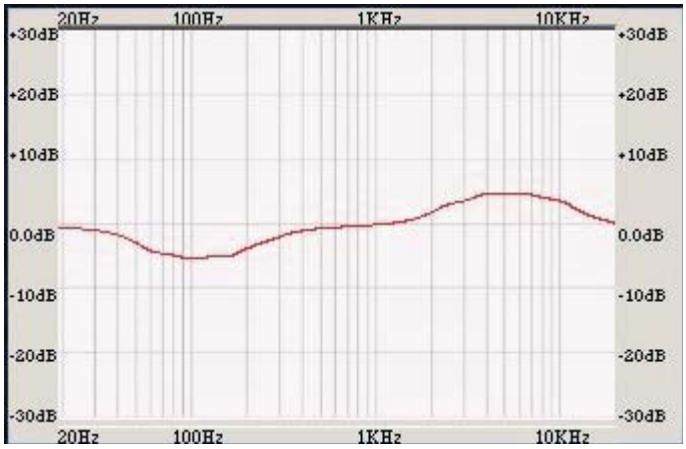
5.1. EQ Presets

a. Flat



This program allows the audio signal to cross the CONTROL30 unmodified.

b. Bass Debug



Bass debug is a program particularly suitable to clean recordings which have an exaggerate bass equalization in the 100 Hz area. This region of the audio spectrum is carefully cleaned and re-balanced by means of a slight boost in the 5 kHz range. The extreme octaves and the central one are left almost untouched. Some modern pop recordings need a similar treatment.

c. BBC Monitor

This program is our homage to a legend. If you have available really full range loudspeaker system, enabling this preset will give you a certain idea of the sound of the famous near field monitors engineered by BBC decades ago and still used by professionals and enthusiasts worldwide...Great for classic British pop recordings.

d. Brilliant

This preset 'moves on' music and gives vitality to 'slow' recordings. The main EQs are centered in the 100 Hz, 1 kHz and 10 kHz area. The boost reaches almost 10 dB in the high end giving more definition to recordings which are poor in high band energy. The low end is controlled down to 0 dB, while the high end is still slightly boosted. Avoid using this programs with too brilliant or noisy recordings. Try it with modern symphonic music.

e. Hi Definition

Keyword is 'no compromise'. Selecting Hi definition you are giving your stereo system or recorder a well characterized timbre; if you listen to this program with a linear system and a linear recording, you will judge it 'nasty', but we aren't thinking to linear things when we make this EQ, just think to some bass-reflex loud-speakers, capable in emission, but confused by the abundance of bass frequencies and the lack of power in the high end, or consider that a similar pre-emphasis could revitalise that sane-sounding but noisy analog reel tape deck, and probably the hi-frequency emphasis we put in this program will be very useful to you.

f. Loudness

The classic 'loudness' filter was once present even in integrated stereo amplifiers, to give more power and definition to sound. With modern day equipments, which need dynamic and linear performance, filters are often not present to shorten the signal path and allow a cleaner electrical structure, but they are analog filters. The CONTROL30 makes use of modern digital DSP techniques to recreate this useful filter (the loudness curve improves the listening experience at low volumes and into noisy environments) without analog circuit complexity. Ideal for clubs and public diffusion at low volumes.

g. Percussion

Four carefully selected boost peaks improve percussion instruments perception. The first peak is located at 100 Hz, the second at 250 Hz, the third at 6 kHz and the fourth at 15 kHz. This program may be used in various kinds of music, giving often very good results and staying away from saturation, thanks to energy recover in the low end of the spectrum.

h. Presence

When you need to underline voices and ambience, without cutting too much of the musical ensemble, 'Presence' is a good choice. It moves forward voices and ambience without sacrificing the rest of the spectrum, thanks to a very progressive EQ curve, peaked at 3500 Hz. Definitely try it if you like natural ambience recordings (live in reverberating environments).

i. Soft

What is worse than a beautiful and super dynamic recording mistreated by a too brilliant and harsh mastering and/or equalization? If you thought to certain black/disco music of the '70/'80, you are plain right. This EQ will complement some great recordings by, say, Earth Wind & Fire as if it was tailored on. As a matter of fact, it is.

j. Super Boost

A hot loudness program for modern music lovers. Good to revitalise old rock and pop tracks which are scarce in dynamics and frequency extension, or to make some little loudspeaker systems that have good power handling but not broad frequency extension seem bigger. It is also suited to re-balance recordings or diffusion systems that tend to be too vocal-centered. As a loudness, Super-boost is able to greatly improve low volume listening, especially in noisy areas.

k. Virtual Sub

Your ideal sound has lots of punch and impact? Your system is a bit shy on low ends, but otherwise linear? Would you like more 'guts' out of a good pop disc? Try this, it could be the answer. On big systems with high power handling and already well capable in the low end, this kind of reinforcement could be like an earthquake. Definitely to try with game sound systems, but pay attention to power output and cone resistance.

I. Functional Data

User Interface

Alphanumeric LCD Display	2×20 characters
Keyboard	7 user keys / 5 LEDs
VU meter	2×6 LEDs (double function)

EQ Filters	Biquadratic Bell Filters type IV Gain: +/- 15 dB step 0.5 dB Frequency: 20Hz to 20kHz, minimum step 1/12 Oct Bandwidth: 0.05 Oct to 3 Oct step 0.05 Oct
Parametric EQs	2×15 Dual Mono, 2×15 Stereo, 1×30 Mono
Graphical EQs	2×15 Dual Mono, 2×15 Stereo, 1×30 Mono
Band Pass Filters	Butterworth up to 2nd order (-12 dB/Oct) Frequency: 20Hz to 20kHz, step 1/12 Oct
Delay line	0 - 510 ms step 2 ms (fine step 21 us)
Output digital volume	-15 / +12 dB step 0.5 dB

5.2. Summary tables

a. Presets

Graphical / Parametric 2×15 Dual Mono/Stereo

Flat: Preset 01/Preset 11/Preset 21/Preset 31

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Bass Debug: Preset 02/Preset 12/Preset 22/Preset 32

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	-0.5	0	-2.5	-3	-3	-1	0	0	0	0	2	3	3	2.5	0
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

BBC Monitor: Preset 03/Preset 13/Preset 23/Preset 33

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	-12	-3	-0.5	2	2.5	2	0	0	0	0	2	2.5	4	2	2.5
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Brilliant: Preset 04/Preset 14/Preset 24/Preset 34

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	4	5	2.5	1	0	0	4	4	0	2	2	7.5	3
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Hi Definition: Preset 05/Preset 15/Preset 25/Preset 35

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	0	0	0	0	0	0	0	2	3	1	4.5	11	1
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Loudness: Preset 06/Preset 16/Preset 26/Preset 36

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	5.5	5	3	1	0	0	0	0	0	2	3	6.5	0.5
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Percussion: Preset 07/Preset 17/Preset 27/Preset 37

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	-2.5	-0.5	-0.5	8	-0.5	7	1	0	0	0	0	2.5	7.5	-1	4.5
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Presence: Preset 08/Preset 18/Preset 28/Preset 38

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	-2.5	-1	-1	-1	-1	0.5	0.5	0	1	3	4.5	5	3	0	-2.5
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Soft: Preset 09/Preset 19/Preset 29/Preset 39

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	-2.5	-1	-1	-1	-1	0.5	0.5	0	1	3	4.5	5	3	0	-2.5
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Super Boost: Preset 10/Preset 20/Preset 30/Preset 40

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	6	8	7	7	0	0	0	0	0	6	5.5	6	9	0
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

Graphical / Parametric 1x30 Mono

Flat: Preset 41/Preset 51

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

Bass Debug: Preset 42/Preset 52

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	0	0	-4	-3	-2	-3	-2	0	0	0	0	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	0	0	0	0	1.5	1.5	0.5	1.5	2.5	2	0	0
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

BBC Monitor: Preset 43/Preset 53

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	-7	-3	-2.5	-1.5	-1	0	1.5	3	2	2	2	0	0	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	0	0	1.5	2.5	0	1.5	1	2.5	3.5	1.5	1	0
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

Brilliant: Preset 44/Preset 54

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0.5	2	2	1.5	1	0	0	0	0	0	0	0	0	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	2.5	0	2	2	0	2	2.5	6.5	3	4.5	3.5	0
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

Hi Definition: Preset 45/Preset 55

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0.5	1	-0.5	0.5	1	0	0	0	0	0	0	0	0	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	2.5	0	2	2	0	2	2.5	2	6	7	7	2
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

Loudness: Preset 46/Preset 56

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	0	0	0	3	4.5	4.5	2.5	2.5	0	0	0	0	0
Frequency [Hz]	25	40	63	100	160	250	400	630	1000	1600	2500	4000	6300	10000	16000
Bandwidth [Oct]	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	0	0	0	0	0	0	0	2	2	4.5	7	0
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

Percussion: Preset 47/Preset 57

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	-1	-1	-1	-1.5	-0.5	-2	11	-0.5	-3	-2.5	-0.5	0	0	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	0	0	0	0.5	0	6.5	0	0	0	6.5	0	0
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

Presence: Preset 48/Preset 58

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	-1	0	-0.5	-0.5	-1	0	-0.5	-0.5	-0.5	0	0	0	0	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	-0.5	2	3	3	2.5	2.5	2.5	3.5	3	2	2	0.5	1	-1	-1
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

Super Boost: Preset 49/Preset 59

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	0	7	2.5	3	5.5	5.5	5.5	4.5	1	1	1.5	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	0	0	0	0	0	2.5	1.5	4	5	6	4.5	1.5
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

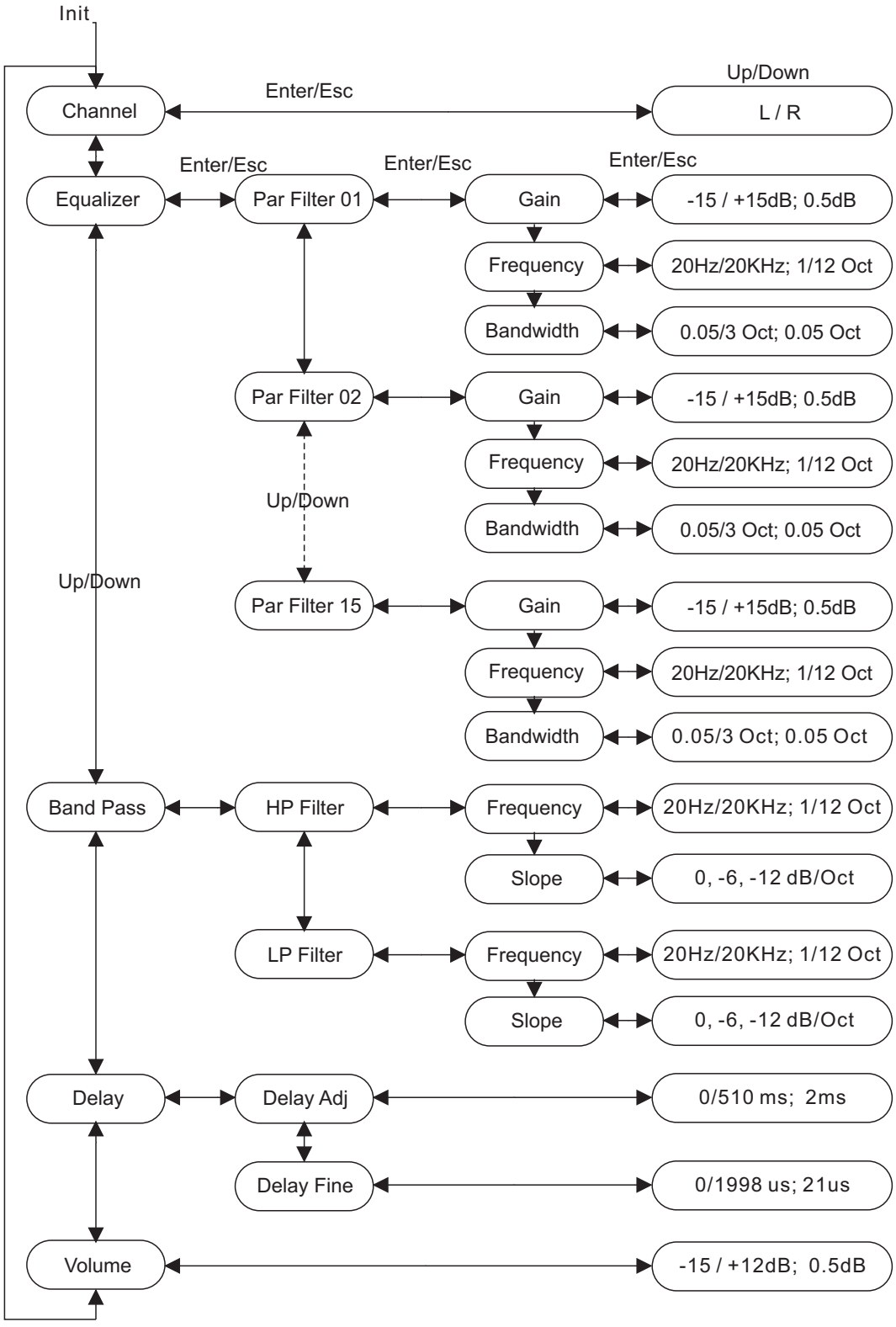
Virtual _ Sub: Preset 50/ Preset 60

	PEQ 1	*PEQ 2*	*PEQ 3*	*PEQ 4*	*PEQ 5*	*PEQ 6*	*PEQ 7*	*PEQ 8*	*PEQ 9*	*PEQ 10*	*PEQ 11*	*PEQ 12*	*PEQ 13*	*PEQ 14*	*PEQ 15*
Gain [dB]	0	0	0	7	3.5	3	5.5	5.5	5.5	4.5	1	1	1.5	0	0
Frequency [Hz]	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

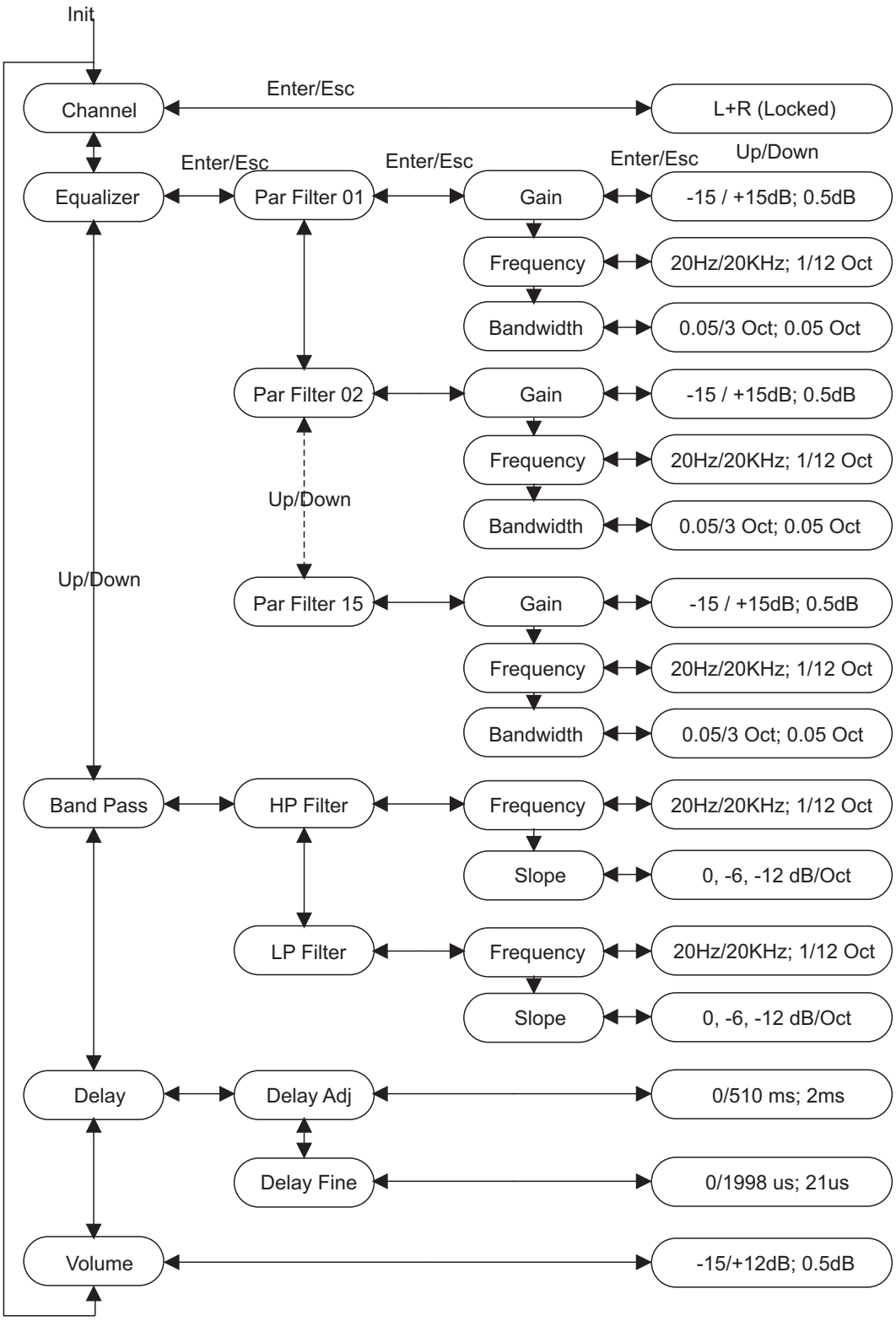
	PEQ 16	*PEQ 17*	*PEQ 18*	*PEQ 19*	*PEQ 20*	*PEQ 21*	*PEQ 22*	*PEQ 23*	*PEQ 24*	*PEQ 25*	*PEQ 26*	*PEQ 27*	*PEQ 28*	*PEQ 29*	*PEQ 30*
Gain [dB]	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0
Frequency [Hz]	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000
Bandwidth [Oct]	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33

b. Block Diagrams

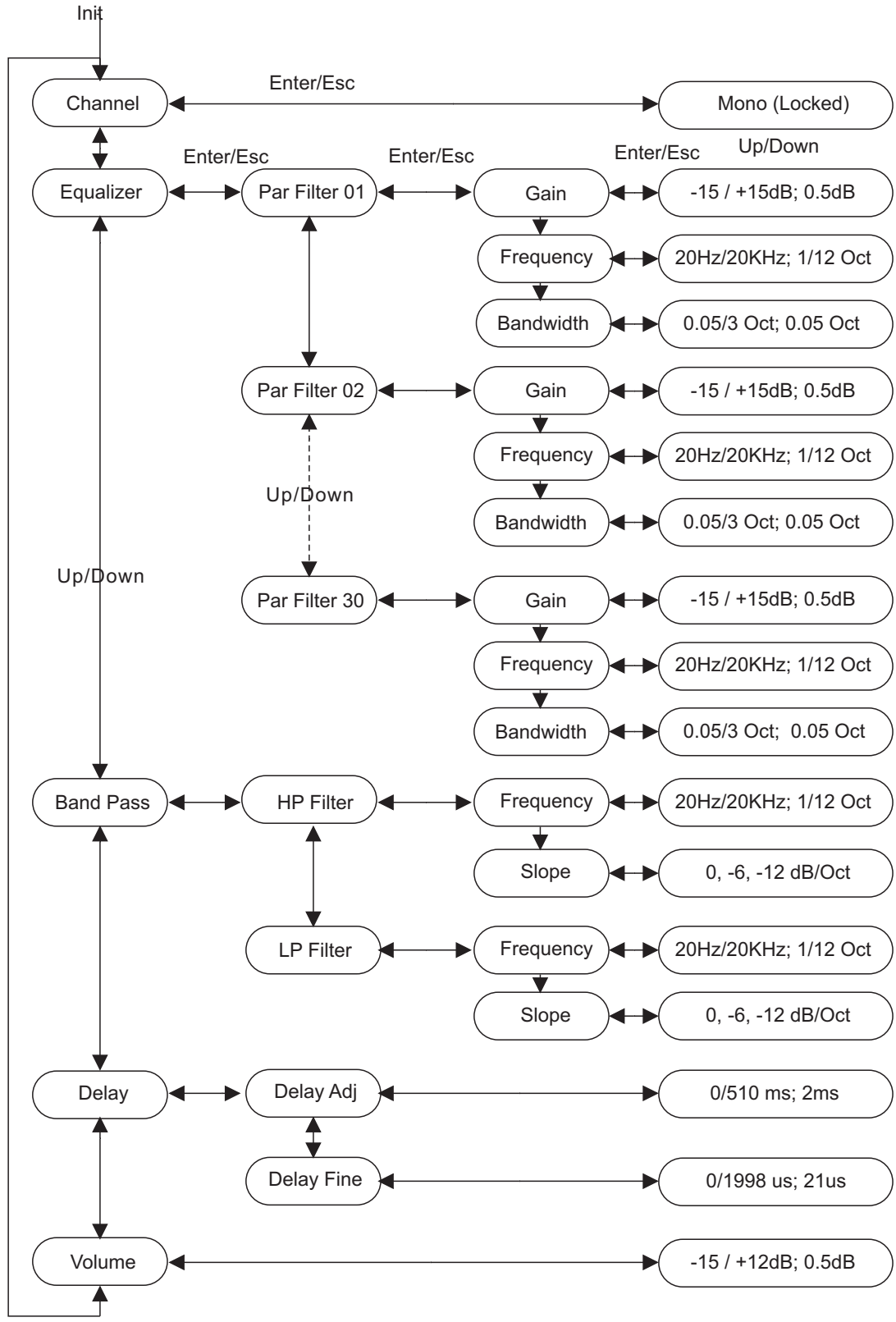
EQ Param. 2×15 Mono - EDIT MENU



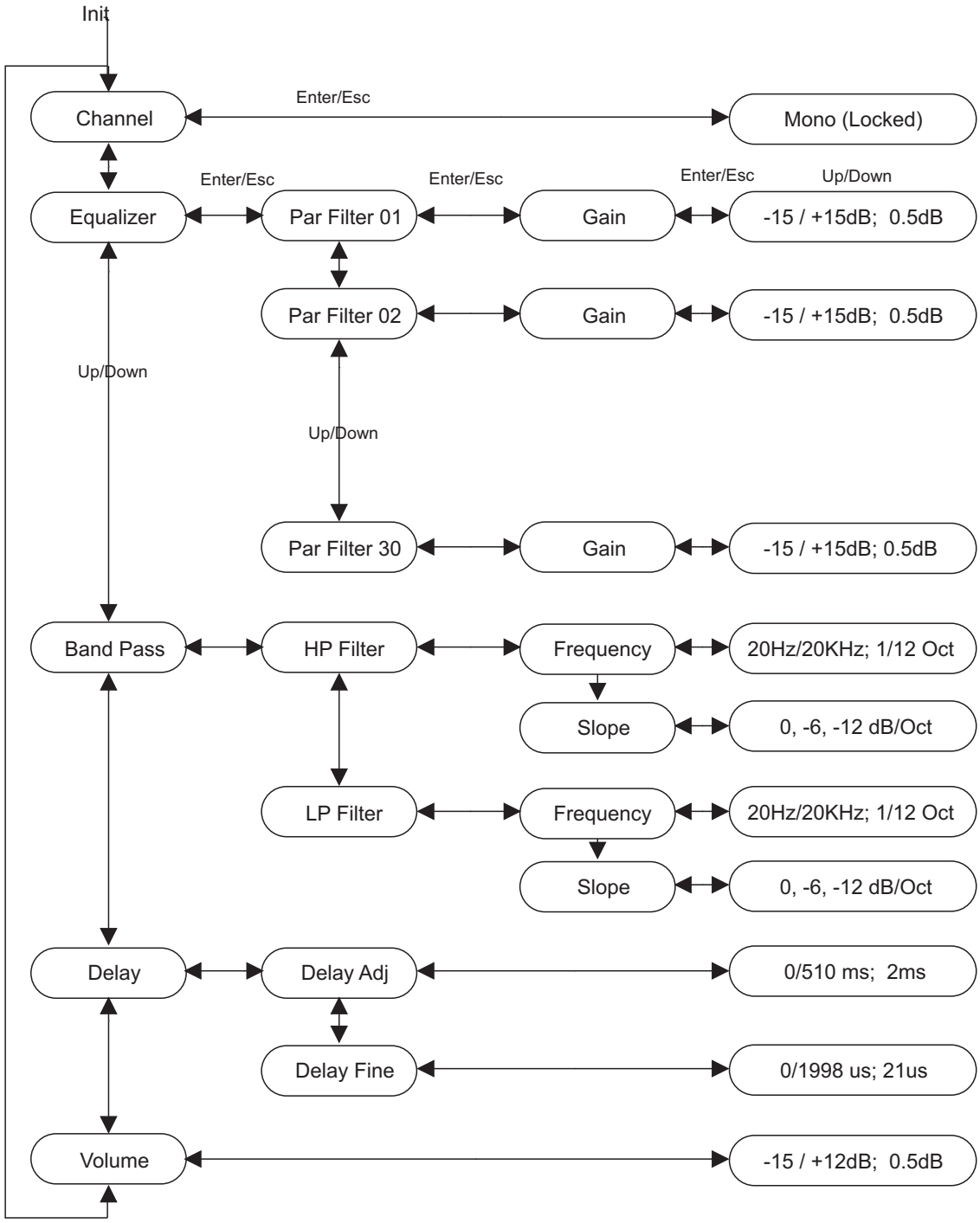
EQ Param. 2×15 Stereo - EDIT MENU



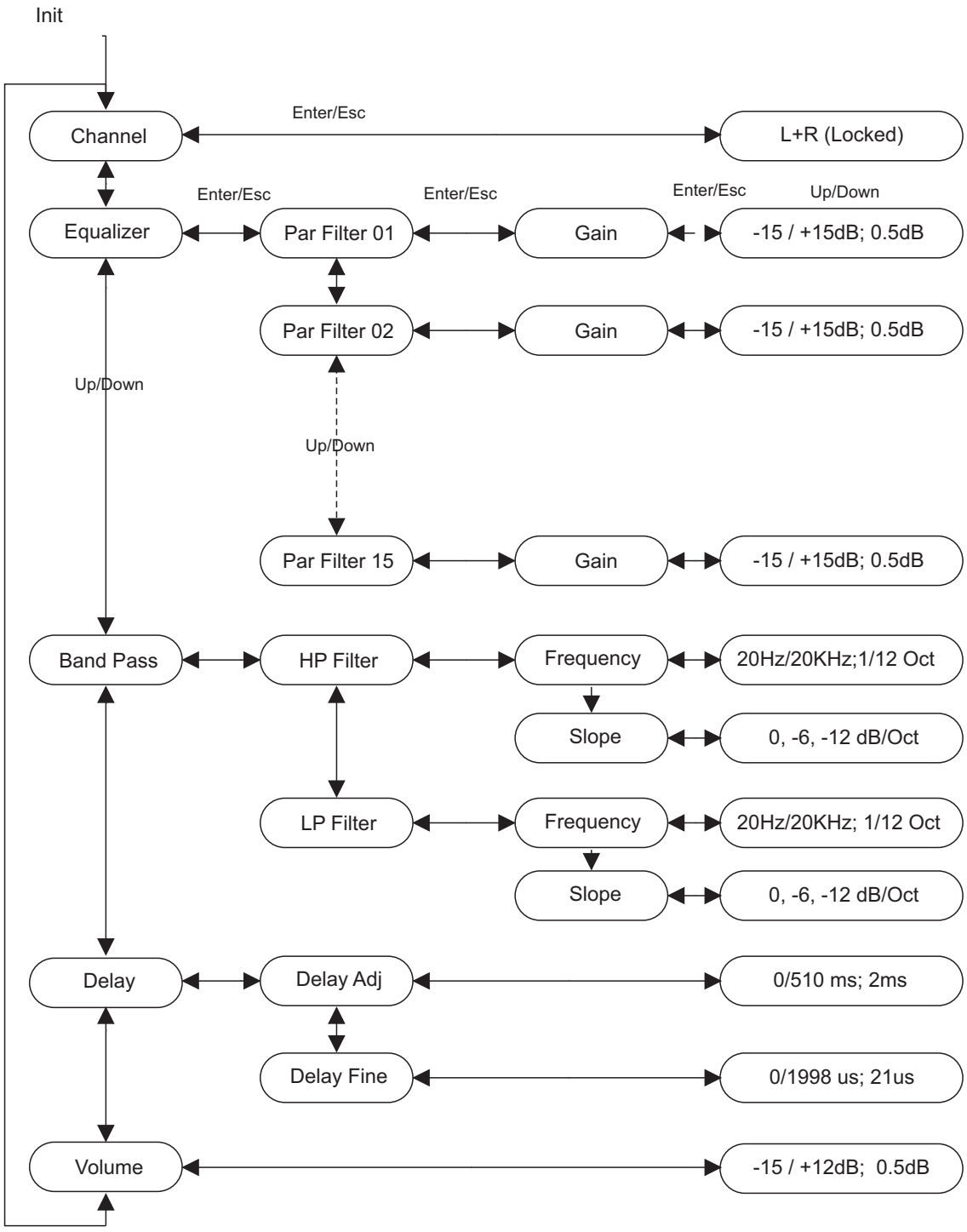
EQ Param. 1×30 Mono - EDIT MENU



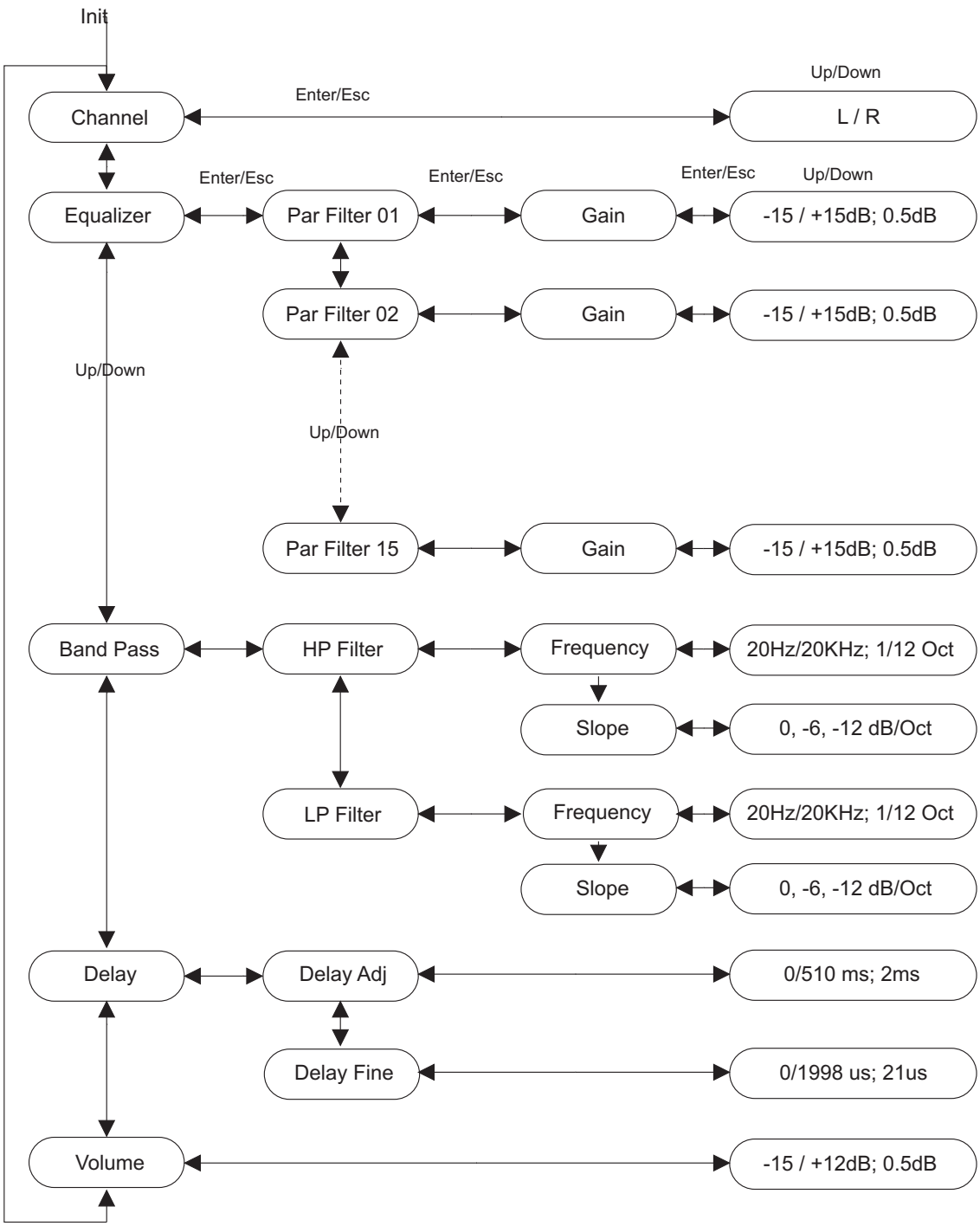
EQ Graph. 1×30 Mono - EDIT MENU

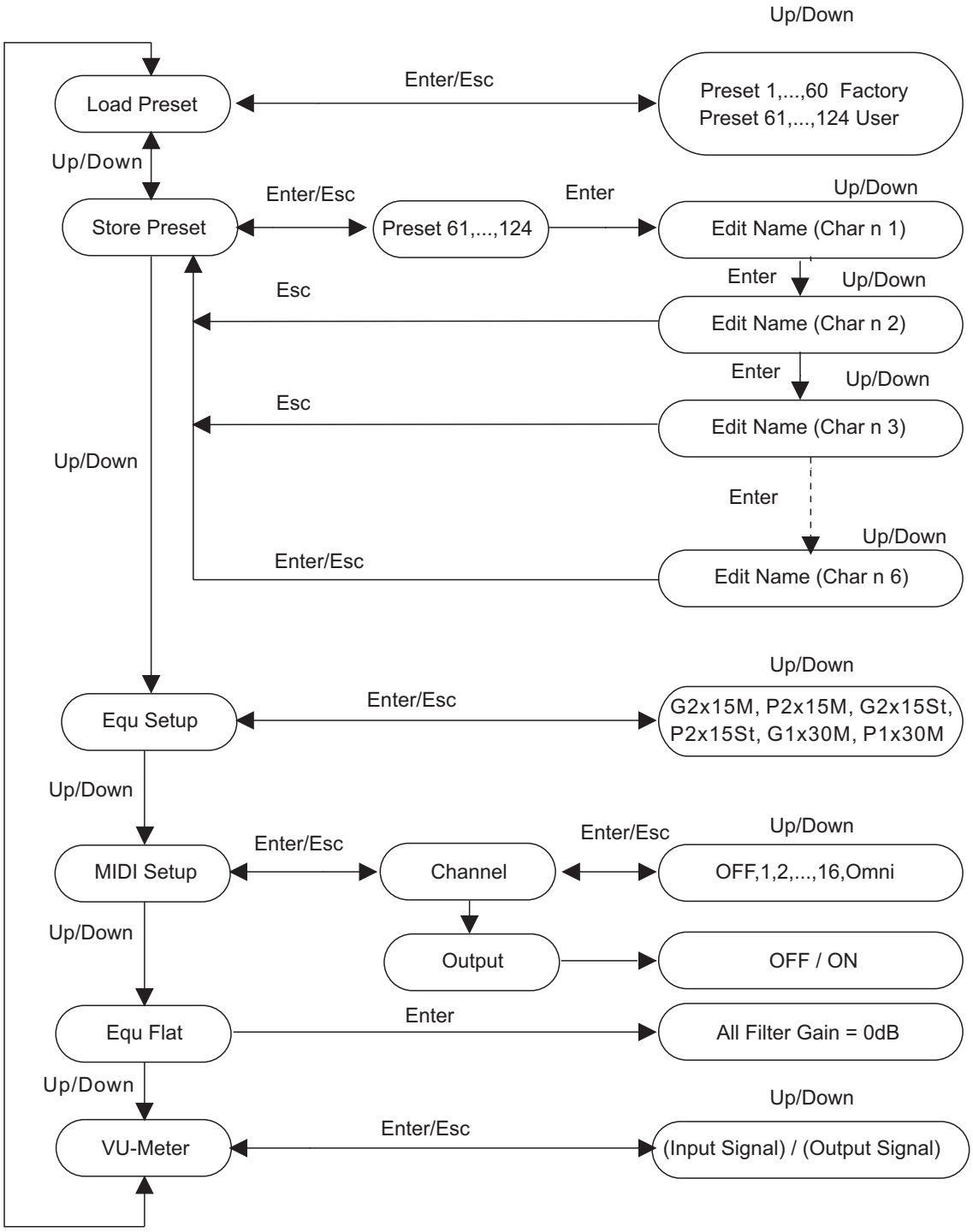


EQ Graph. 2×15 Stereo - EDIT MENU



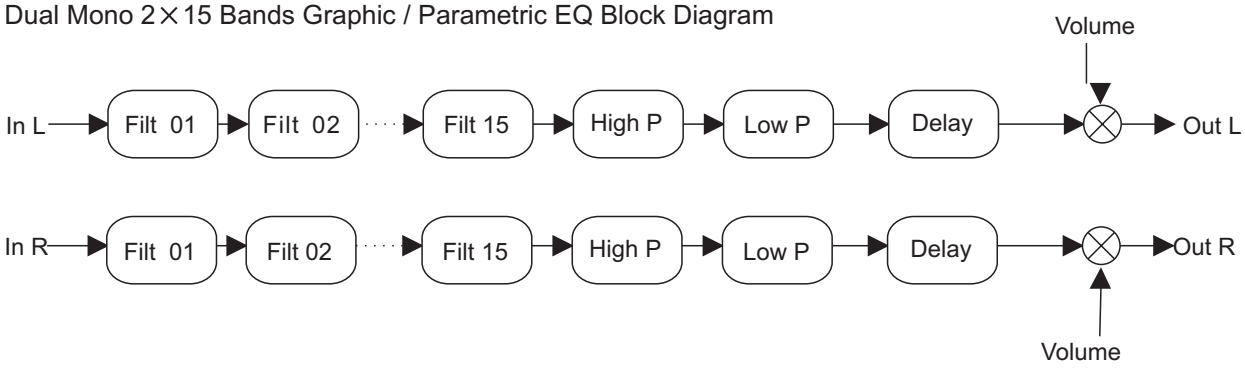
EQ Graph. 2×15 Mono - EDIT MENU



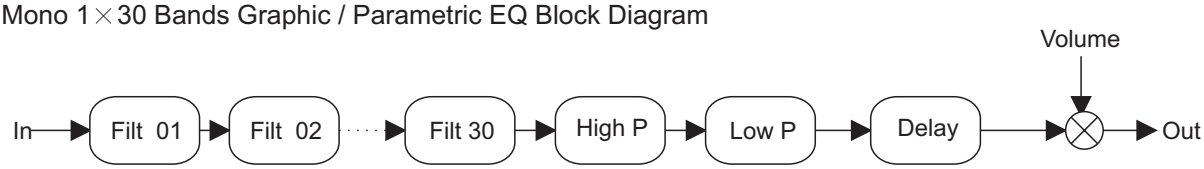


Note:
A preset is loaded only if it's of the same type of the EQ currently active (Equ Setup Function).

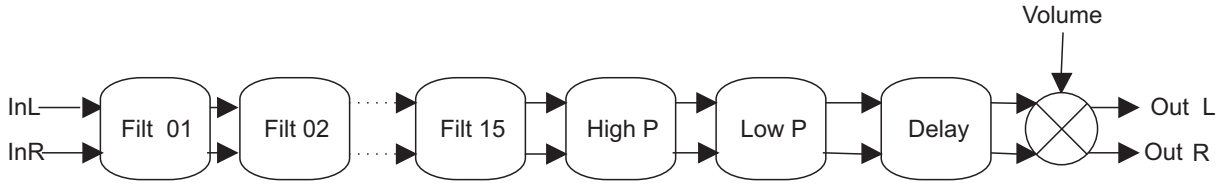
Dual Mono 2×15 Bands Graphic / Parametric EQ Block Diagram



Mono 1×30 Bands Graphic / Parametric EQ Block Diagram



Stereo 2×15 Bands Graphic / Parametric EQ Block Diagram



c. MIDI

MIDI 1st Byte - CONTROL CHANGE

Standard MIDI (Program Change, Control Change)

Program Change

1. If the system is in Bypass (Bypass LED = ON) whatever preset change request is ignored.
2. If the system is configured as i.e.G2×15M and a request to load a different EQ type preset arrives (i.e. P1 ×30M), the request is ignored.
3. A request to load an un-initial preset location (Preset User) is ignored.
4. User presets created for a type of EQ can not be loaded on another type. It's up to the user to create an unambiguous list of presets.
5. If the system is disconnected from the MIDI network, it keeps the last loaded preset. If the system is turned off and on, it will start with the last loaded preset, losing the information about editing done with control change. It is advisable the use of a sequencer.

MIDI 1st Byte - PROGRAM CHANGE
MIDI 2nd Byte 0,...,127
(Min. Time Between Changes: 6 seconds)

MIDI 2nd Byte	Preset	Legend
0,...,9	Preset 1,...,10	Preset Custom - type G2×15M
10,...,19	Preset 11,...,20	Preset Custom - type P2×15M
20,...,29	Preset 21,...,30	Preset Custom - type G2×15S
30,...,39	Preset 31,...,40	Preset Custom - type P2×15S
40,...,49	Preset 41,...,50	Preset Custom - type G1×30M
50,...,59	Preset 51,...,60	Preset Custom - type P1×30M
60,...,123	Preset 61,...,124	Preset User

Control Change (Max. Frequency of Changes: 120 BPM)
MIDI commands will be executed from control30 only, if the status of the device is on the "Top Ring" or utility menu and if the MIDI channel is set properly.

1. System executes MIDI commands also when in bypass.
2. Control 0×00 (Bank Set)
   Possible values are 0, 1,...,5. Given cases:
   a. G2×15M, P2x15M
      Bank = 0, 2, 4 selects channel 2 (Right) and bank = 0, 1, 2
      Bank = 1, 3, 5 selects channel 1 (Left) and bank = 0, 1, 2
   b. G2×15S, P2×15S
      Bank = 0, 2, 4 selects channel 1 & 2 (Left & Right) and bank = 0,1,2
      Bank = 1, 3, 5 selects channel 1 & 2 (Left & Right) and bank = 0,1,2
   c. G1×30, P1×30
      Bank = 0, 2, 4 selects channel 2 (Right) and bank = 0, 1, 2 of EQ parametric filters 1,...,15
      Bank = 1, 3, 5 selects channel 2 (Right) and bank = 0, 1, 2 of EQ parametric filters 16,...,30
3. Control 0×03 (Select Eq type) (Min. Time Between Changes: 6 seconds)
   Possible values are 0, 1,...,5. Given cases:

a. G2×15M = 0, P2×15M = 1, G2×15S = 2, P2×15S = 3, G1×30 = 4, P1×30 = 5
   Each change of Eq type the system loads a default preset for the EQ type.

4. Control 0×07 (Volume)
   Possible values are 0, 1,...,54 corresponding to -15dB, -14.5dB,...,+12dB (step = 0.5dB)
5. Control 0×0E (Delay Adj)
   Possible values are 0, 1,...,127 corresponding to 0ms, 4ms,...,508ms (step = 4ms)
6. Control 0×0F (Delay Fine)
   Possible values are 0, 1,...,95 corresponding to 0us, 21us,...,1998us (step = 21us)
7. Control 0×10 (Equalizer/Bypass)
   Possible values are 0 and 1 corresponding to Equalizer = 0, Bypass = 1. Passing from Equalizer -> bypass
8. Control 0×11 (Filter Gain/Freq/Q)
9. Control 0×12 (Filter Gain/Freq/Q)
10. Control 0×13 (Filter Gain/Freq/Q)
11. Control 0×14 (Filter Gain/Freq/Q)
12. Control 0×15 (Filter Gain/Freq/Q)
13. Control 0×16 (Filter Gain/Freq/Q)
14. Control 0×17 (Filter Gain/Freq/Q)
15. Control 0×18 (Filter Gain/Freq/Q)
16. Control 0×19 (Filter Gain/Freq/Q)
17. Control 0×1A (Filter Gain/Freq/Q)
18. Control 0×1B (Filter Gain/Freq/Q)
19. Control 0×1C (Filter Gain/Freq/Q)
20. Control 0×1D (Filter Gain/Freq/Q)
21. Control 0×1E (Filter Gain/Freq/Q)
22. Control 0×1F (Filter Gain/Freq/Q)
    a. G2×15M
       Bank = 0, 2, 4 selects Gain, possible values are 0, 60; -15, +15dB step = 0.5dB Channel 2
       Bank = 1, 3, 5 selects Gain, possible values are 0, 60; -15, +15dB step = 0.5dB Channel 1

b. P2×15M
Bank = 0 selects Gain, possible values are 0, 60; -15, +15dB step = 0.5dB Channel 2
Bank = 1 selects Gain, possible values are 0, 60; -15, +15dB step = 0.5dB Channel 1
Bank = 2 selects Gain, possible values are 0, 120; 20Hz,...,20KHz step = 1/12 Oct Channel 2
Bank = 3 selects Gain, possible values are 0, 120; 20Hz,...,20KHz step = 1/12 Oct Channel 1
Bank = 4 selects BandWidth, possible values are 0, 59; 0.05,...,3 Oct step = 0.05 Oct Channel 2
Bank = 5 selects BandWidth, possible values are 0, 59; 0.05,...,3 Oct step = 0.05 Oct Channel 1

c. G2×15S
Bank = 0, 1, 2, 3, 4, 5 selects Gain, possible values are 0, 60; -15, +15dB step = 0.5dB Channel 1 & 2

d. P2×15S
Bank = 0, 1 selects Gain, possible values are 0, 60; -15,+15dB step = 0.5dB Channel 1 & 2
Bank = 2, 3 selects Freq, possible values are 0, 120; 20Hz,...,20KHz step = 1/12 Oct Channel 1 & 2
Bank = 4, 5 sel. BandWidth, values 0, 59; 0.05,...,3 Oct step = 0.05 Oct Channel 1 & 2

e. G1×30M
Bank = 0, 2, 4 sel. Gain of first 15 filters, values are 0, 60; -15, +15dB step = 0.5dB Channel 2
Bank = 1, 3, 5 sel. Gain of the following15 filters, values are 0, 60; -15, +15dB step = 0.5dB Channel 2

f. P1×30M
Bank = 0 sel. Gain of first 15 filters, possible values are 0, 60; -15, +15dB step = 0.5dB Channel 2
Bank = 1 sel. Gain of the following 15 filters, values are 0, 60; -15, +15dB step = 0.5dB Channel 2
Bank = 2 sel. Freq. of first 15 filters, possible values are 0, 120; 20Hz,...,20KHz step = 1/12 Oct Channel 2
Bank = 3 sel. Freq. of the following 15 filters, values are 0, 60, 0, 120; 20Hz,...,20KHz step = 1/12 Oct Channel 2
Bank = 4 sel. BandWidth first 15 filters, values 0, 59; 0.05,...,3 Oct step = 0.05 Oct Channel 2
Bank = 5 sel. BandWidth following 15 filters, values 0, 59; 0.05,...,3 Oct step = 0.05 Oct Channel 2

23. Control 0×50 (HP Freq)
values 0,...,120 giving HP freq: 20Hz,...,20KHz step = 1/12 Oct

24. Control 0×51 (HP Slope)
values 0,1,2 giving: bypass filter, -6dB/Oct, -12dB/Oct

25. Control 0×52 (LP Freq)
values 0,...,120 giving HP freq: 20Hz,...,20KHz step = 1/12Oct

26. Control 0×53 (LP Slope)
values 0, 1, 2 giving: bypass filter, -6dB/Oct, -12dB/Oct

Command Sequence for MIDI standard control

1. Preset change:
a. Make sure the system is not bypassed.
(Control Change: command = 0×10 value = 0)
b. Make sure the preset is of the same type as current EQ type.
(Control Change: command = 0×03 val = 0,...,5)
c. Be sure you load the preset on the correct channel.
(Control Change: command = 0×00 val = 0,...,5)
d. Load preset
Program Change: val = 0,...,127)

2. Parameter Change:
a. Make sure the system is not bypassed.
(Control Change: command = 0×10 value = 0)
b. Issue the chosen command, keeping present to work on the right bank.
(Control Change: command = 0×00 val = 0,...,5)
c. Issue Control Change: command/value

6. TECHNICAL SPECIFICATIONS

Analog Input Section		
	Inputs	Analog variable gain, 2 XLR-F electronically balanced
	Input Impedance	44 kOhms
	Max. input Level	15 dBu (4.4V RMS)
	Sensitivity	-22 dBu (63mV RMS)
Analog Output Section		
	Outputs	Analog variable gain, 2 XLR-M electronically balanced
	Output Impedance	<150 Ohms
	Max. output Level	17 dBu on 600 Ohms (5.5V RMS)
Digital / Analog Interface		
	Amplitude Response	20 Hz - 20 kHz + 0.2 / - 2.5 dB
	Signal to Noise Ratio	90 dB (A wtg. / 20 Hz-20kHz)
	THD+N	0.03 % @ 1kHz -6 dB (VU-meter level)
	Group Delay	700 μs
	Sampling Frequency	46.875 kHz
	Conversion	1 bit Sigma-Delta
Digital	Processor Speed	12 MIPs
	DSP Resolution	24×32bits
	Control	Microprocessor
MIDI Section		
	Connections	Input/Output/Thru
	Sockets	5-poles DIN (female)
	Mode	Photo-coupled
Power Supply		
	Connector Type	3-pole IEC, grounded
	Type	Servo controlled, stabilized
	Mains Supply	95-120V～/210-240V～,60-50Hz
	Power Rating	9 W
User Interface		
	α numeric LCD Display	2×20 characters
	Keyboard	7 user keys / 5 LEDs
	VU meter	2×6 LEDs
Physical		
	Size	Standard 19" rack mounting
	Dimensions	483 (W)×232.5 (D)×44 (H)mm (19"×9.3"×1.7")
	Net Weight	3.8 Kg (8.38lb)

7. WARRANTY

1. WARRANTY REGISTRATION CARD

To obtain Warranty Service, the buyer should first fill out and return the enclosed Warranty Registration Card within 10 days of the Purchase Date.

All the information presented in this Warranty Registration Card gives the manufacturer a better understanding of the sales status, so as to purport a more effective and efficient after-sales warranty service.

Please fill out all the information carefully and genuinely, miswriting or absence of this card will void your warranty service.

2. RETURN NOTICE

2.1 In case of return for any warranty service, please make sure that the product is well packed in its original shipping carton, and it can protect your unit from any other extra damage.

2.2 Please provide a copy of your sales receipt or other proof of purchase with the returned machine, and give detail information about your return address and contact telephone number.

2.3 A brief description of the defect will be appreciated.

2.4 Please prepay all the costs involved in the return shipping, handling and insurance.

3. TERMS AND CONDITIONS

3.1 ▲LTO warrants that this product will be free from any defects in materials and/or workmanship for a period of 1 year from the purchase date if you have completed the Warranty Registration Card in time.

3.2 The warranty service is only available to the original consumer, who purchased this product directly from the retail dealer, and it can not be transferred.

3.3 During the warranty service, ▲LTO may repair or replace this product at its own option at no charge to you for parts or for labor in accordance with the right side of this limited warranty.

3.4 This warranty does not apply to the damages to this product that occurred as the following conditions:

- Instead of operating in accordance with the user's manual thoroughly, any abuse or misuse of this product.
- Normal tear and wear.
- The product has been altered or modified in any way.
- Damage which may have been caused either directly or indirectly by another product / force / etc.
- Abnormal service or repairing by anyone other than the qualified personnel or technician.

And in such cases, all the expenses will be charged to the buyer.

3.5 In no event shall ▲LTO be liable for any incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.

3.6 This warranty gives you the specific rights, and these rights are compatible with the state laws, you may also have other statutory rights that may vary from state to state.

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